



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue
Seattle, Washington 98101

MEMORANDUM

SUBJECT: Recommendations on the Proposed Remedy for the Shipyard Sediment Operable Unit (OU) of the Harbor Island Superfund Site

FROM: for Randy Smith, Director, Environmental Cleanup Office,
EPA Region 10 *Kim B. Roberts*

TO: Bruce Means, Chair, National Remedy Review Board (NRRB)

My staff and I appreciate the effort on the part of the NRRB in reviewing the cost-effectiveness of the proposed remedy for the Harbor Island Shipyard Sediment OU. The purpose of this memorandum is to explain how Region 10 intends to address the following concerns raised by the NRRB about the proposed remedy.

The NRRB concluded that of all the alternatives considered, Alternative 3 or 4 would provide adequate environmental protection. However, the NRRB was not able to determine if Alternative 4, the proposed remedy, is more cost-effective than Alternative 3. In particular, the NRRB identified two related factors which could significantly affect the relative cost of these two alternatives: 1) the final volumes of dredged sediment associated with each alternative, and 2) the cost of disposal for dredged sediments, which is strongly dependent on the availability of an aquatic disposal site, which would be the most cost-effective disposal option.

Based on available sediment data, the volume of dredged sediment associated with Alternative 3 is estimated to be about 75% greater than the volume associated with Alternative 4. The most cost-effective disposal option for dredged sediments is either confined aquatic disposal (CAD) or confined nearshore disposal (CND). In the Harbor Island Sediment Feasibility Study, several CAD and CND sites had been identified, but at that time it was uncertain if any of these sites would be available for sediments to be dredged from Harbor Island. Region 10 now believes that an available CND site has been identified which can contain most of the dredged sediment volume associated with Alternative 4. Todd Shipyards has proposed that a CND facility be constructed at the end of two slips owned by Todd Shipyards in the West Waterway. This on-site CND facility would make it feasible to cost-effectively implement Alternative 4. Alternative 3 would be more difficult to implement because a second disposal site would have to be found to accept the additional sediment



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volume associated with Alternative 3. Based on estimated cost for disposal in a CND facility, the cost to implement Alternative 3 would be about 50% more expensive than Alternative 4. For this reason, Alternative 4 is the proposed remedy.

Although current sediment data predict that the volume of dredged sediment associated with Alternative 3 is significantly greater than Alternative 4, there is the remote possibility that sediment data collected during remedial design may show that the volume associated with Alternative 3 is only slightly greater than Alternative 4. In this case, the additional dredging and disposal costs associated with Alternative 3 may be offset by the long-term monitoring and maintenance costs associated with Alternative 4, making Alternative 3 more cost-effective than Alternative 4. To account for this possibility, the Record of Decision (ROD) will identify Alternative 3 as a contingent remedy if the remedial design data demonstrate that Alternative 3 is more cost-effective than Alternative 4.

Another factor identified by the NRRB, which could affect the cost-effectiveness of the selected remedy, is the extent of under-pier dredging required. It was initially estimated that under-pier dredging would increase dredged sediment volume by about 10% and cost about five times as much as open-water dredging. However, after further evaluation it appears that under-pier dredging may increase sediment volume by as much as 20% and cost up to 10 times as much as open-water dredging. At such volumes and costs, under-pier dredging would significantly increase the costs of the selected remedy. In addition, it is uncertain how under-pier dredging will affect pier stability. To determine effects on pier stability, a structural analysis of the piers, will have to be conducted during remedial design. For these reasons, the extent of under-pier dredging, and its impact on the cost-effectiveness of the selected remedy, will be determined during remedial design after dredged sediment volumes, costs of under-pier dredging, and effects of dredging on pier stability are better known. If it is determined that under-pier dredging does not provide an environmental benefit in proportion to cost, or if pier stability is an issue, EPA may then consider other means of achieving the cleanup goals for under-pier sediments.

The NRRB recommended that Region 10 clarify how the combination of dredging and capping in the proposed remedy is intended to achieve the remedial action objective. The remedial action objective in the ROD is to achieve a sediment quality which corresponds to "no adverse effects" in marine organisms. Alternative 4 will achieve this objective through a combination of dredging and capping. First, all sediment which exceeds the chemical Cleanup Screening Level (CSL) of the Washington Sediment Management Standards would be dredged. Based on data collected in Puget Sound, sediments which exceed the chemical CSL are always associated with significant adverse effects in marine organisms. After dredging, remaining sediments which exceed the chemical and/or biological Sediment Quality Standard (SQS), the level

above which minor adverse biological effects are observed, would be capped with a minimum of two feet of clean sediment. This two-foot cap would isolate remaining contaminants which exceed SQS concentrations, and would prevent exposure of marine organisms to these remaining contaminants.

One final concern of the NRRB is the permanence of the cap required by the remedy because ship prop-wash may cause the cap to erode and release remaining contaminants contained under the cap. The need to armor the cap will be determined by analyses conducted during remedial design. It is estimated that the cost of armoring the entire cap would be about \$800 K, which is only about 6% of the overall cost for Alternative 4. If cap armoring is implemented, the cost of armoring would be offset by a significant reduction in cap maintenance cost. Cap maintenance cost is currently included in the cost estimate for Alternative 4, and is projected to be about \$600 K over the first 10 years. If armoring is necessary, the additional cost of armoring would be recovered over time through reduced maintenance cost. Therefore, it is not expected that cap armoring would significantly impact the cost-effectiveness of Alternative 4.

Again, we appreciated the opportunity to explain the basis of our proposed remedy to the NRRB. This review identified components of the remedy which need further evaluation during remedial design to ensure that the remedy is cost-effective.